REMARKS

The present Amendment leaves claims 1 and 5-23 unchanged, and adds claims 24 and 25. Therefore, the present application has pending claims 1 and 5-25.

Information Disclosure Statement

Applicants submitted a form equivalent to a Form PTO-1449 on January 19, 2001. However, Applicant has not received an initialed Form PTO-1449 from the Examiner acknowledging his consideration of the references. Applicants respectfully request that the Examiner include an initialed Form PTO-1449 with the next Patent Office communication. A copy of the Form PTO-1449 filed on January 19, 2001 is attached for the Examiner's convenience.

Response to Arguments

In response to Applicants' arguments filed on January 6, 2006, the Examiner asserts that the arguments "have been fully considered but they are moot in view of the new grounds of rejection" (see page 18, item 5 of the Office Action). However, it should be noted that the new grounds for rejection (i.e., the Sasaki reference) is relied upon by the Examiner to support the rejection of the features added by amendment to independent claims 1, 8, 11, 15, 18 and 21. That is to say, the Examiner does not rely upon Sasaki to support the rejection of the other features that Applicants argued as distinguishing over Lundahl in view of Giles, and further in view of Morrison. Regarding the other features of the present invention, which Applicants argued as distinguishing over the prior art, the Examiner merely restates the rejection from the previous Office Action, and provides Applicants with no indication as to why the Examiner was not persuaded by Applicants' arguments. Accordingly, Applicants respectfully request that the Examiner fully consider

Applicants' arguments, and if no rationale can be provided as to why Applicants' arguments are not persuasive, Applicants respectfully request the Examiner to withdraw the rejection.

35 USC §103 Rejections

Claims 1 and 5-23 stand rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 6,636,862 to Lundahl, et al. ("Lundahl") in view of U.S. Patent No. 5,850,339 to Giles, further in view of U.S. Patent No. 5,727,128 to Morrison, and even further in view of U.S. Patent No. 5,959,672 to Sasaki. This rejection is traversed for the following reasons. Applicants submit that the features of the present invention, as recited in claims 1 and 5-23, are not taught or suggested by Lundahl, Giles, Morrison, or Sasaki, whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

No amendments were made to claims 1 and 5-23. Therefore, the scope of the claims, which are directed to a score calculation method, a score calculation system, an apparatus having a storage medium with a program for calculating a score, and a score calculating program as recited, for example, in independent claims 1, 8, 11, 15, 18, and 21, has not changed.

Claims 1, 5-7, 11, and 15-23

The present invention, as recited in claim 1 and as similarly recited in claims 11, 15, 18, and 21, provides a score calculation method, system and program, and an apparatus including a storage medium with a program for calculating a score. The score calculation method is for calculating a score from input data, which includes a plurality of attributes. The score calculation method includes a step of

preparing a plurality of prediction models arranged in a hierarchical tree structure in a computer. As shown in Fig. 3, for example, a hierarchical tree structure may include a first root layer 331 and subsequent layers 332 and 333, where the lower-most subsequent layer 333 is a final leaf layer of the hierarchical tree structure. The method further includes a step of calculating an output value from at least one attribute included in the input data, using one of the plurality of prediction models in the first root layer. Another step of the method includes comparing the output value with a threshold value, and then selecting one of the prediction models in a subsequent layer of the hierarchical tree structure according to a result of the comparison. Yet another step of the method includes repeatedly executing the steps of calculating an output value, comparing the output value with a threshold, and selecting a prediction model based on the result of the comparison. These steps are repeated for each subsequent layer, until the final leaf layer of the hierarchical tree structure is reached. Once the final leaf layer is reached, the method includes the steps of selecting one of the prediction models of the final leaf layer, and calculating a score from the input data using the selected prediction model of the final leaf layer. In the claimed method, the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. In addition the prediction models of the final leaf layer are scoring models. The prior art does not teach or suggest all of these features.

The above described features of the present invention, as recited in the claims, are not taught or suggested by any of the references of record. More

specifically, the features are not taught or suggested by Lundahl, Giles, Morrison, or Sasaki, whether taken individually or in combination with each other.

Lundahl discloses a method and system for dynamically analyzing data and more specifically allows for the prediction of responses based on inputted data. However, Lundahl does not teach or suggest a score calculation method, system and program, and an apparatus including a storage medium with a program for calculating a score, as recited in claims 1, 11, 15, 18, and 21 of the present invention.

Lundahl's system and method for dynamically analyzing data includes a series of computational steps executed in three phases. In the first phase, a cluster analysis is performed on a data matrix Y in order to segment the data into appropriate clusters for subsequent computational analysis. The second phase is a modeling phase, where if corresponding rows of a second matrix X and the matrix Y refer to the same underlying object, then a relationship is developed between the X and Y matrices. This relationship allows the method a system of Lundahl to predict responses in Y on the basis of input X data. The third phase is also a modeling phase. In the third phase, if corresponding columns of Y and rows of Z each refer to the same underlying object, then a relationship is developed between the X, Y and Z data matrices, which allows the method and system to link X with Z, by way of Y. To illustrate the modeling phases, consider the case where matrix X relates to consumers and lifestyle answers, matrix Y relates to consumers and carbonated beverages, and matrix Z relates to carbonated beverages and taste criteria. Matrices X and Y both refer to the underlying object of consumers, and matrices Y and Z both refer to the underlying object of carbonated beverages. The matrix Y

links the matrices X and Z to obtain a relationship between the lifestyle answers of X and the taste criteria of Z. In this way, Lundahl combines prediction models having different underlying objects, to obtain a prediction of an optimal product for a given consumer.

One feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes a step of preparing a plurality of prediction models arranged in a hierarchical tree structure in the computer. As conceded by the Examiner, Lundahl fails to teach this feature. The Lundahl system includes X, Y and Z matrices, which are prediction models, but these matrices are not arranged in a hierarchical tree structure as claimed. In addition, although the Examiner concedes that Lundahl fails to teach a hierarchical tree structure, the Examiner asserts that Lundahl teaches "a first root layer" of the hierarchical tree structure, "a subsequent layer" of the hierarchical tree structure and a "final leaf layer" of the hierarchical tree structure. The Examiner cites a first data matrix to support the assertion that Lundahl teaches a first root layer, and does not specifically point out any support for Lundahl teaching a subsequent layer and a final leaf layer. Applicants submit that a first data matrix is not a first root layer of a hierarchical tree structure, and further submit that because Lundahl does not teach a hierarchical tree structure, as claimed, then it cannot teach a first root layer, a subsequent layer, or a final leaf layer thereof, in the manner claimed.

Another feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes a step of comparing an output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree structure based on the result of the comparison. As conceded

by the Examiner, Lundahl fails to teach this feature. The Lundahl system generates an output value, but this output value is not compared to a threshold, and there is no selection of a prediction model on the basis of this comparison, as claimed.

Yet another feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes where the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. As conceded by the Examiner, Lundahl does not teach this feature.

Therefore, Lundahl fails to teach or suggest "preparing a plurality of prediction models arranged in a hierarchical tree structure in the computer" as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21.

Furthermore, Lundahl fails to teach or suggest "comparing the output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree structure according to a result of the comparison by a selection unit of the computer" as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21.

Even further, Lundahl fails to teach or suggest "wherein any one of the prediction models of any layer other than the final leaf layer is one of a scoring model to calculate a score from attributes of the input data and an attribute prediction model to predict, from attributes of the input data, a value of another attribute" as recited in claims 11, 15, 18, and 21.

The above noted deficiencies of Lundahl are not supplied by any of the other references, particularly Giles, Morrison and Sasaki. Therefore, combining the

teachings of Lundahl with Giles, Morrison and Sasaki still fails to teach or suggest the features of the present invention as recited in the claims.

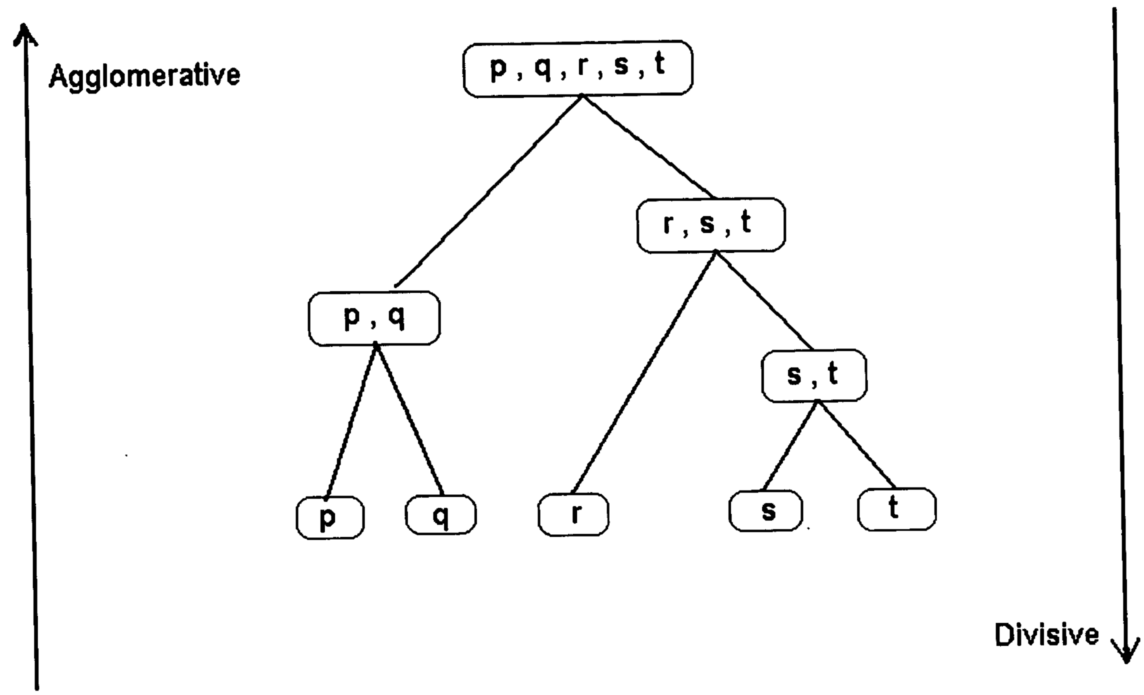
Giles discloses a method of analyzing data in cause and effect relationships. However, Giles does not teach or suggest a score calculation method, system and program, and an apparatus including a storage medium with a program for calculating a score, as recited in claims 1, 11, 15, 18, and 21 of the present invention.

Giles' method includes analyzing a data set of a repeated process to determine the ranges of values of independent input process variables that are most associated with a specific outcome. The independent input process variables can be either numeric or categorical in nature and dependent output process variable has either of exactly two outcomes. In Giles, scores are obtained for each independent input variable as a measure of the frequency of occurrence of the specific process outcome. These scores are obtained when the numeric independent input variable is within a defined range or when the categorical independent input variable has each possible value. Iterative processes are used to maximize the score while selecting different combinations of the specific number of independent process variables. As a result, a manufacturing process can be enhanced by selecting the values of the independent input variables which are most likely to result in an acceptable product or by avoiding the values of the independent input variables that are most likely to result in a defective product.

One feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes a step of preparing a plurality of prediction models arranged in a hierarchical tree structure in the computer. In the

Office Action, the Examiner concedes that Lundahl does not teach a hierarchical tree structure, as claimed. However, the Examiner asserts that Giles teaches this feature, citing column 2, lines 39-63. As described in the cited passage, Giles discloses that "[m]any of the traditional cluster analysis methods, both partitioning and hierarchical, are encumbered by looking for many or all possible clusters within the data" (see column 2, lines 39-41). In addition, as described in column 2, lines 60-63, Giles discloses that "[c]lassification trees split[ ] the data set into subsets such that the final output which contains the most important variables within specific ranges often contains a relatively small subset of the original data records." Contrary to the Examiner's assertions, the hierarchical cluster analysis method disclosed in Giles is quite different from the plurality of prediction models arranged in a hierarchical tree structure of the present invention.

To further illustrate the known method of hierarchical cluster analysis disclosed in Giles, the Examiner's attention is directed to the following diagram:



The cluster analysis method of Giles is a known method of data segmentation. As shown in the above diagram, this method of data segmentation groups or segments a collection of objects (e.g., observations, individuals, cases, or data rows) into subsets or "clusters", such that those within each cluster are more closely related to one another than objects assigned to different clusters. In hierarchical clustering, a series of partitions take place to group or segment the data into a particular cluster. This series of partitioning may run from a single cluster containing all objects, to N clusters, each containing a single object.

The hierarchical arrangement of data clusters in Giles is not the same as the hierarchical arrangement of prediction models in the present invention. Furthermore, the cluster analysis of Giles is not the same as the analysis of score calculation method in the present invention. For example, the hierarchical arrangement of Giles

does not include an arrangement of prediction models, but rather includes clusters of related data. By way of further example, Giles does not analyze its clustered data in the manner claimed. Therefore, the hierarchical arrangement of data clusters and the accompanying cluster analysis of Giles is quite different from the claimed hierarchical tree structure and analysis using prediction models.

Another feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes a step of comparing an output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree structure based on the result of the comparison. The Examiner concedes that Lundahl in view of Giles does not disclose comparing an output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree based on the result of the comparison, as recited in claims 1 and 11. Giles discloses generating an output value, but this output value is not compared to a threshold, and there is no selection of a prediction model on the basis of this comparison, as claimed.

Yet another feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes where the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. As conceded by the Examiner, Giles does not teach this feature.

Therefore, Giles fails to teach or suggest "<u>preparing a plurality of prediction models arranged in a hierarchical tree structure in the computer</u>" as recited in claims claim 1, and as similarly recited in claims 11, 15, 18, and 21.

Furthermore, Giles fails to teach or suggest "comparing the output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree structure according to a result of the comparison by a selection unit of the computer" as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21.

Even further, Giles fails to teach or suggest "wherein any one of the prediction models of any layer other than the final leaf layer is one of a scoring model to calculate a score from attributes of the input data and an attribute prediction model to predict, from attributes of the input data, a value of another attribute" as recited in claims 11, 15, 18, and 21.

The above noted deficiencies of Lundahl in view of Giles are not supplied by any of the other references, particularly Morrison. Therefore, combining the teachings of Lundahl in view of Giles with Morrison still fails to teach or suggest the features of the present invention as recited in the claims.

Morrison discloses a system and method for automatically determining a set of variables for use in creating a process model. However, Morrison does not teach or suggest a score calculation method, system and program, and an apparatus including a storage medium with a program for calculating a score, as recited in claims 1, 11, 15, 18, and 21 of the present invention.

Morrison's system and method automatically determines a set of input variables for use in creating a process model using a neural network. In designing a neural network for a process model, it is important to choose the appropriate input variables. Morrison discloses the use of a partial least squares (PLS) analysis to aid in determining an appropriate set of input variables. A PLS analysis is a linear

mathematical tool that repeats its steps until a calculated residual error falls below a predetermined threshold. As shown in the flowchart in Fig. 5, if the threshold is not exceeded, a set of potential model input and output variables are refined. If the threshold is exceeded, training files for the neural network are created based on the selected inputs and outputs (see items 114, 116, 118 and 120 and the accompanying text). In this way, the process model is developed from the chosen set of model inputs.

One feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes a step of preparing a plurality of prediction models arranged in a hierarchical tree structure in the computer. Morrison does not teach a hierarchical tree structure, and the Examiner does not rely upon Morrison for teaching this feature. Furthermore, Morrison does not teach a plurality of models arranged in a hierarchical tree structure, as claimed.

Another feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes a step of comparing an output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree structure based on the result of the comparison. The Examiner concedes that Lundahl in view of Giles does not disclose comparing an output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree based on the result of the comparison, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21. However, the Examiner asserts that Morrison teaches this feature. Contrary the Examiner's assertions, Morrison does not teach this feature. As shown in Fig. 5, in step 114 of the flowchart, Morrison discloses running a PLS analysis on a set of potential model input and output

variables. In step 116, it is determined whether the PLS regression coefficient, which is calculated in the PLS analysis, is sufficient by comparing it to a threshold value. Based on this comparison, if the PLS regression coefficient is less than the threshold, it is not sufficient, and step 118 refines the selected set of potential model input and output variables (column 15, lines 39-64). Also based on this comparison, if the PLS regression coefficient exceeds the threshold, then the coefficient is sufficient, and step 120 creates training files for the neural network, based on the selected inputs and outputs (column 16, lines 19-30). Therefore, Morrison discloses either refining potential input and output variables or creating training files for the neural network, based upon the disclosed comparison. This is distinguished from selecting one of the prediction models in a subsequent layer of the hierarchical tree based on the result of a comparison, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21.

Yet another feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes where the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. As conceded by the Examiner, Morrison does not teach this feature.

Therefore, Morrison fails to teach or suggest "<u>preparing a plurality of prediction models arranged in a hierarchical tree structure in the computer</u>" as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21.

Furthermore, Morrison fails to teach or suggest "<u>comparing the output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree structure according to a result of the comparison by a selection</u>

<u>unit of the computer</u>" as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21.

Even further, Morrisson fails to teach or suggest "<u>wherein any one of the prediction models of any layer other than the final leaf layer is one of a scoring model to calculate a score from attributes of the input data and an attribute prediction model to predict, from attributes of the input data, a value of another attribute</u>" as recited in claims 11, 15, 18, and 21.

The above noted deficiencies of Lundahl in view of Giles, further in view of Morrison, are not supplied by any of the other references, particularly Sasaki. Therefore, combining the teachings of Lundahl in view of Giles and Morrison, with Sasaki, still fails to teach or suggest the features of the present invention as recited in the claims.

Sasaki teaches a picture signal encoding system, a picture signal decoding system, and a picture recognition system. However, there is no teaching or suggestion in Sasaki of a score calculation method, system and program, and an apparatus including a storage medium with a program for calculating a score, as recited in claims 1, 11, 15, 18, and 21 of the present invention.

Sasaki discloses a picture signal encoding system capable of transmitting a motion picture at an extremely low rate while sufficiently controlling the occurrence of a retransmission mode and the occurrence of a picture freeze. The encoding system includes an encoding control section, an attribute memory, an attribute prediction section and an area extraction and recognition processing section. To achieve the extremely low rate of transmission, the encoder system integrally performs the alteration of the syntax, the substitution of the code word, the adaptive control for the

prediction of the current frame encoding attribute based on the past encoding attribute and the attribute decision, the object area extraction based on the motion and a model, the area-separated quantization control, and the control of the necessary number of transformation coefficients according to the use mode, the transmission rate and the motion occurrence quantity. A protocol transformer is provided to match the current picture compression standard (H.261), so that the encoding system can be made with a simple arrangement.

- ***Sasaki is Nonanalogous Art***

Sasaki's system, which is in a field entirely different from that of the present invention, is **nonanalogous art**. As provided in MPEP 2141.01(a), a reference relied upon under 35 U.S.C. §103 must be analogous prior art. Specifically, "the reference must either be in the field of Applicants' endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). The U.S. Patent and Trademark Office classified Sasaki's picture signal encoding, decoding and recognition system under Television (Class 348). This class has no relationship to the subject matter of the present invention, which has been classified under Data Processing: Financial Business Practice, Management, or Cost/Price Determination (Class 705). Therefore, Applicants submit that Sasaki is not in the field of Applicants' endeavor. Furthermore, Sasaki is not reasonably pertinent to the particular problem with which the inventor was concerned. Therefore, this rejection should be withdrawn.

In addition to being **nonanalogous art**, Sasaki does not supply the deficiencies as previously discussed regarding Lundahl in view of Giles and

Morrison. Therefore, the combination of Lundahl, Giles, Morrison, and Sasaki does not provide the invention, as claimed.

For example, one feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes a step of preparing a plurality of prediction models arranged in a hierarchical tree structure in the computer. Sasaki does not teach a hierarchical tree structure, and the Examiner does not rely upon Sasaki for teaching this feature. Furthermore, Sasaki does not teach a plurality of models arranged in a hierarchical tree structure, as claimed.

By way of further example, another feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes a step of comparing an output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree structure, based on the result of the comparison. Sasaki does not disclose this feature, and the Examiner does not rely upon Sasaki for teaching this feature.

By way of even further example, yet another feature of the present invention, as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21, includes where the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. Contrary to the Examiner's assertions, Sasaki does not teach this feature. More specifically, although Sasaki uses words such as "prediction" and "model", Sasaki is in a different technological field from the present invention. Sasaki's model is not a scoring model or a prediction model, as in the present invention. Furthermore, Sasaki does not receive

individual data as input and does not output a score or any value as in the present invention.

To further illustrate the distinction between Sasaki and the claimed features, the present invention relates to the statistical processing of data. Past accumulated data groups indicate a tendency, which is represented by a score or a value. The relationship between the data (input) and the score or value (output) is expressed by a model. The model is made from the past accumulated data. The present invention calculates the score using the hierarchical model, as shown in Fig. 3, to predict the tendency. On the other hand, Sasaki only handles motion picture image signals, and cannot handle other data. The model of Sasaki is for extracting motion area, and is not for calculating a score or predicting another attribute. Sasaki's model corresponds to a template, which is not statistical. The attributes described in column 16, lines 7 to 16 are control information included in the encoded data and defined in a standard, such as MPEG. The attribute is hierarchically encoded, as shown in Fig. 54. The attribute predicting section n23 predicts the current attribute data under the encoding on the basis of the past attribute data, since the successive frames of the motion picture change little by little. The past attribute may be used for the current encoding. This is not predicting a value of "another" attribute, as claimed.

Therefore, Sasaki fails to teach or suggest "<u>preparing a plurality of prediction models arranged in a hierarchical tree structure in the computer</u>" as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21.

Furthermore, Sasaki fails to teach or suggest "<u>comparing the output value with a threshold and selecting one of the prediction models in a subsequent layer of the hierarchical tree structure according to a result of the comparison by a selection</u>

unit of the computer" as recited in claim 1, and as similarly recited in claims 11, 15, 18, and 21.

Even further, Sasaki fails to teach or suggest "wherein any one of the prediction models of any layer other than the final leaf layer is one of a scoring model to calculate a score from attributes of the input data and an attribute prediction model to predict, from attributes of the input data, a value of another attribute" as recited in claims 11, 15, 18, and 21.

Claims 8-10 and 12-14

The present invention, as recited in independent claim 8, provides a score calculation system for calculating a score from input data including a plurality of attributes. The system includes a calculation means for processing input data using a plurality of prediction models arranged in a hierarchical tree structure. The system also includes a selecting means for selecting one the prediction models in a subsequent layer of the hierarchical tree structure, and a display means for displaying a score. The calculation means calculates an output value with the prediction model in an Nth layer using at least one attribute included in the input data. The selecting means selects one of the prediction models in a (N+1)th layer, based on the output value of the prediction model of the Nth layer. The calculation means repeated calculates the output value and the selecting means repeatedly selects one of the prediction models in the (N+1)th layer based on the output value, while incrementing N. These repeated steps end when the prediction model of a final leaf layer of the hierarchical tree structure is reached, and one the prediction models of the final leaf layer is selected. The calculation means calculates a score from the input data using the selected prediction model of the final leaf layer, and the

display means displays the score output from the final leaf layer prediction model. In the claimed method, the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. In addition, the prediction models of the final leaf layer are scoring models. The prior art does not teach or suggest all of these features.

The above described features of the present invention, as recited in the claims, are not taught or suggested by any of the references of record. More specifically, the features are not taught or suggested by Lundahl, Giles, Morrison, or Sasaki, whether taken individually or in combination with each other.

As discussed in more detail above, Lundahl discloses a method and system for dynamically analyzing data. More specifically, Lundahl allows for the prediction of responses based on inputted data. The method and system of Lundahl distinguishes from the score calculation system as recited in independent claim 8.

One feature of the present invention, as recited in claim 8, includes a calculation means for processing input data using a plurality of prediction models arranged in a hierarchical tree structure. The Examiner concedes that Lundahl does not teach a plurality of prediction models arranged in a hierarchical tree structure, as claimed. Lundahl teaches the use of prediction models, but these prediction models are not arranged in a hierarchical tree structure in the manner claimed.

Another feature of the present invention, as recited in claim 8, includes where the calculation means repeatedly calculates an output value and the selecting means repeatedly selects the (N+1)th layer prediction model selection, while incrementing N. These repeated steps continue until the prediction model of the final leaf layer of

the hierarchical tree structure is reached, and one of the prediction models of the final leaf layer is selected. Contrary to the Examiner's assertions, Lundahl does not teach this feature. As discussed above, the Examiner concedes that Lundahl does not disclose where prediction models are arranged in a hierarchical tree structure, as claimed. Applicants submit that because Lundahl does not teach a hierarchical tree structure, then it follows that Lundahl does not teach a final leaf layer of an hierarchical tree structure, as claimed.

Yet another feature of the present invention, as recited in claim 8, includes where the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. As conceded by the Examiner, Lundahl does not teach this feature.

Therefore, Lundahl fails to teach or suggest "<u>calculation means in a computer for processing input data using a plurality of prediction models arranged in a hierarchical tree structure</u>" as recited in claim 8.

Furthermore, Lundahl fails to teach or suggest "<u>the calculation means and the selecting means repetitiously executing the output value calculation and the (N + 1)-th layer prediction model selection while incrementing N until the prediction model of a final leaf layer of the hierarchical tree structure is reached and selects one of prediction models of the final leaf layer</u>" as recited in claim 8.

Even further, Lundahl fails to teach or suggest "<u>wherein any one of the prediction models of any layer other than the final leaf layer is one of a scoring model to calculate a score from attributes of the input data and an attribute prediction model</u>

to predict, from attributes of the input data, a value of another attribute" as recited in claim 8.

The above noted deficiencies of Lundahl are not supplied by any of the other references, particularly Giles and Sasaki. Therefore, combining the teachings of Lundahl with Giles, Morrison and Sasaki still fails to teach or suggest the features of the present invention as recited in the claims.

As previously discussed, Giles discloses a method for analyzing a data set of a repeated process to determine the ranges of values of independent input process variables that are most associated with a specific outcome. The method, as disclosed in Giles, distinguishes from the score calculation system recited in independent claim 8.

One feature of the present invention, as recited in claim 8, includes a calculation means. Specifically, the present invention, as recited in claim 8, includes a calculation means for processing input data using a plurality of prediction models arranged in a hierarchical tree structure. The Examiner concedes that Lundahl does not teach a hierarchical tree structure, but asserts that Giles teaches this feature. Contrary to the Examiner's assertions, however, Giles does not teach this feature. Giles discloses a known cluster analysis method. The disclosed method is hierarchical in that groups of data are divided into clusters in a hierarchical manner. This is quite different from arranging prediction models in a hierarchical structure, as claimed.

Another feature of the present invention, as recited in claim 8, includes the repeated calculation of the output value by the calculation means and the repeated selection of one of the prediction models in an (N+1)the layer based on the output

value of the prediction model of the Nth layer, while incrementing N. The repeated steps are executed until the prediction model of the final leaf layer of the hierarchical tree structure is reached, and one of the prediction models of the final leaf layer is selected. Giles does not teach or suggest an arrangement of prediction models in a hierarchical tree structure. Therefore, this feature, which includes a step of incrementing until the prediction model of a final leaf layer of the hierarchical tree structure, is not taught or suggested by Giles.

Yet another feature of the present invention, as recited in claim 8, includes where the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. As conceded by the Examiner, Giles does not teach this feature.

Therefore, Giles fails to teach or suggest "<u>calculation means in a computer for processing input data using a plurality of prediction models arranged in a hierarchical tree structure</u>" as recited in claim 8.

Furthermore, Giles fails to teach or suggest "<u>the calculation means and the selecting means repetitiously executing the output value calculation and the (N + 1)-th layer prediction model selection while incrementing N until the prediction model of a final leaf layer of the hierarchical tree structure is reached and selects one of prediction models of the final leaf layer</u>" as recited in claim 8.

Even further, Giles fails to teach or suggest "<u>wherein any one of the prediction models of any layer other than the final leaf layer is one of a scoring model to calculate a score from attributes of the input data and an attribute prediction model to</u>

predict, from attributes of the input data, a value of another attribute" as recited in claim 8.

The above noted deficiencies of Lundahl in view of Giles are not supplied by any of the other references, particularly Morrison and Sasaki. Therefore, combining the teachings of Lundahl in view of Giles with Morrison and Sasaki still fails to teach or suggest the features of the present invention as recited in the claims.

As discussed above, Morrison's system and method automatically determine a set of input variables for use in creating a process model using a neural network. The system and method of Morrison is quite different from the score calculation system of the present invention, as recited in independent claim 8.

One feature of the present invention, as recited in claim 8, includes a calculation means for processing input data using a plurality of prediction models arranged in a hierarchical tree structure. Morrison does not teach a hierarchical tree structure. Furthermore, Morrison does not teach a plurality of models arranged in a hierarchical tree structure, as claimed.

Another feature of the present invention, as recited in claim 8, includes the repeated calculation of the output value by the calculation means and the repeated selection of one of the prediction models in an (N+1)the layer based on the output value of the prediction model of the Nth layer, while incrementing N. The repeated steps are executed until the prediction model of the final leaf layer of the hierarchical tree structure is reached, and one of the prediction models of the final leaf layer is selected. Morrison does not teach or suggest an arrangement of prediction models in a hierarchical tree structure. Therefore, this feature, which includes a step of

incrementing until the prediction model of a final leaf layer of the hierarchical tree structure, is not taught or suggested by Morrison.

Yet another feature of the present invention, as recited in claim 8, includes where the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. As conceded by the Examiner, Morrison does not teach this feature.

Therefore, Morrison fails to teach or suggest "calculation means in a computer for processing input data using a plurality of prediction models arranged in a hierarchical tree structure" as recited in claim 8.

Furthermore, Morrison fails to teach or suggest "the calculation means and the selecting means repetitiously executing the output value calculation and the (N + 1)-th layer prediction model selection while incrementing N until the prediction model of a final leaf layer of the hierarchical tree structure is reached and selects one of prediction models of the final leaf layer" as recited in claim 8.

Even further, Morrison fails to teach or suggest "wherein any one of the prediction models of any layer other than the final leaf layer is one of a scoring model to calculate a score from attributes of the input data and an attribute prediction model to predict, from attributes of the input data, a value of another attribute" as recited in claim 8.

As previously discussed, Sasaki teaches a picture signal encoding system, a picture signal decoding system, and a picture recognition system. However, there is no teaching or suggestion in Sasaki of a score calculation system as recited, for example, in independent claim 8 of the present invention.

Also as previously discussed, Sasaki is **nonanalogous art**. In addition to being **nonanalogous art**, Sasaki does not supply the deficiencies as previously discussed regarding Lundahl in view of Giles and Morrison. Therefore, the combination of Lundahl, Giles, Morrison, and Sasaki does not provide the invention, as claimed.

For example, one feature of the present invention, as recited in claim 8, includes a calculation means for processing input data using a plurality of prediction models arranged in a hierarchical tree structure. Sasaki does not disclose this feature, and the Examiner does not rely upon Sasaki for teaching this feature.

By way of further example, another feature of the present invention, as recited in claim 8, includes the repeated calculation of the output value by the calculation means and the repeated selection of one of the prediction models in an (N+1)the layer based on the output value of the prediction model of the Nth layer, while incrementing N. The repeated steps are executed until the prediction model of the final leaf layer of the hierarchical tree structure is reached, and one of the prediction models of the final leaf layer is selected. Sasaki does not disclose this feature, and the Examiner does not rely upon Sasaki for teaching this feature.

By way of even further example, yet another feature of the present invention, as recited in claim 8, includes where the prediction model is either a scoring model that calculates a score from attributes of the input data or an attribute prediction model that predicts another attribute, based on the attributes of the input data. Contrary to the Examiner's assertions, Sasaki does not teach this feature. As previously discussed, although Sasaki uses words such as "prediction" and "model", Sasaki is in a different technological field from the present invention. Sasaki's model

is not a scoring model or a prediction model, as in the present invention. Furthermore, Sasaki does not receive individual data as input and does not output a score or any value as in the present invention.

Therefore, Sasaki fails to teach or suggest "calculation means in a computer for processing input data using a plurality of prediction models arranged in a hierarchical tree structure" as recited in claim 8.

Furthermore, Sasaki fails to teach or suggest "the calculation means and the selecting means repetitiously executing the output value calculation and the (N + 1)-th layer prediction model selection while incrementing N until the prediction model of a final leaf layer of the hierarchical tree structure is reached and selects one of prediction models of the final leaf layer" as recited in claim 8.

Even further, Sasaki fails to teach or suggest "wherein any one of the prediction models of any layer other than the final leaf layer is one of a scoring model to calculate a score from attributes of the input data and an attribute prediction model to predict, from attributes of the input data, a value of another attribute" as recited in claim 8.

Each of Lundahl, Giles, Morrison, and Sasaki suffer from the same deficiencies relative to the features of the present invention as recited in the claims. Therefore, combining the teachings of Giles and Morrison with Lundahl in the manner suggested by the Examiner does not render obvious the features of the present invention, as recited in claims 1 and 5-23. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 1 and 5-23 as being unpatentable over Lundahl in view of Giles, further in view of Morrison, and even further in view of Sasaki, is respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references used in the rejection of claims 1 and 5-23.

New Claims 24 and 25

Claims 24 and 25 were added to more clearly recite features of the present invention. Claims 24 and 25 are dependent on claim 1. Therefore, Applicants submit that claims 24 and 25 are allowable for at least the reasons discussed above regarding independent claim 1.

In view of the foregoing amendments and remarks, Applicants submit that claims 1 and 5-25 are in condition for allowance. Accordingly, early allowance of claims 1 and 5-25 is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger, Malur & Brundidge, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 500.39461X00).

Respectfully submitted,

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